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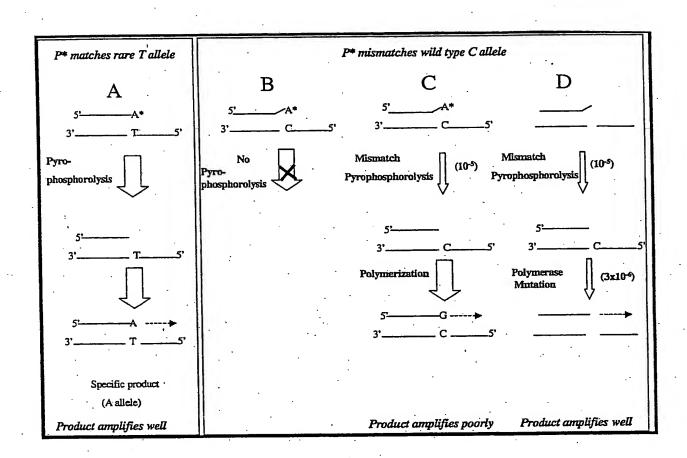


FIG. 1

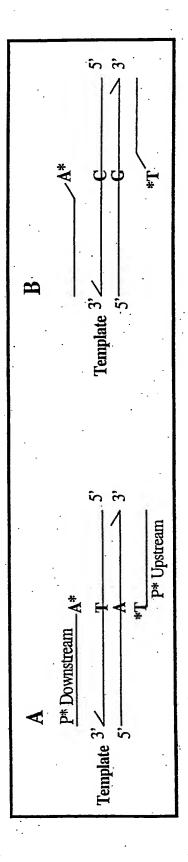


FIG. 2

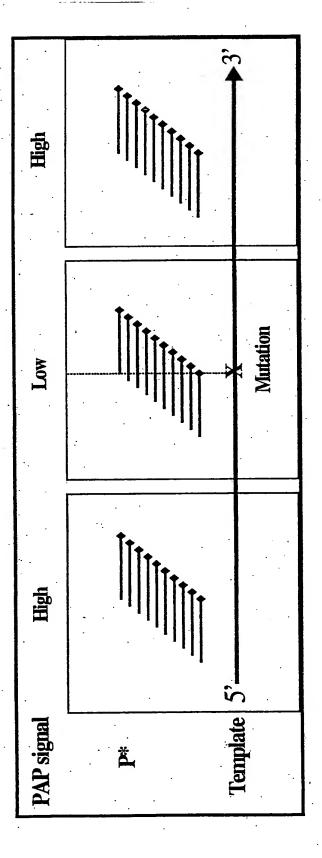


FIG. 3

A. Wild type sample S'-3' sense strand of the wild type sequence C T G C T T G G G A C T T G A G G T C T C A G PAP signal with dye-labeled dideoxynucleoside triphosphates idd**ddA idd**ddA Base calling: wild type template C T G C T T G G A A C T T G A G C T C A G B. G-A mutation idd**ddA idd*
CTGCTTA TCAG

FIG. 4

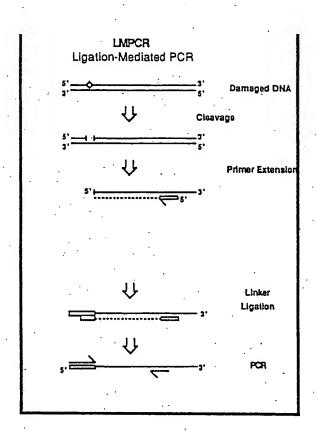
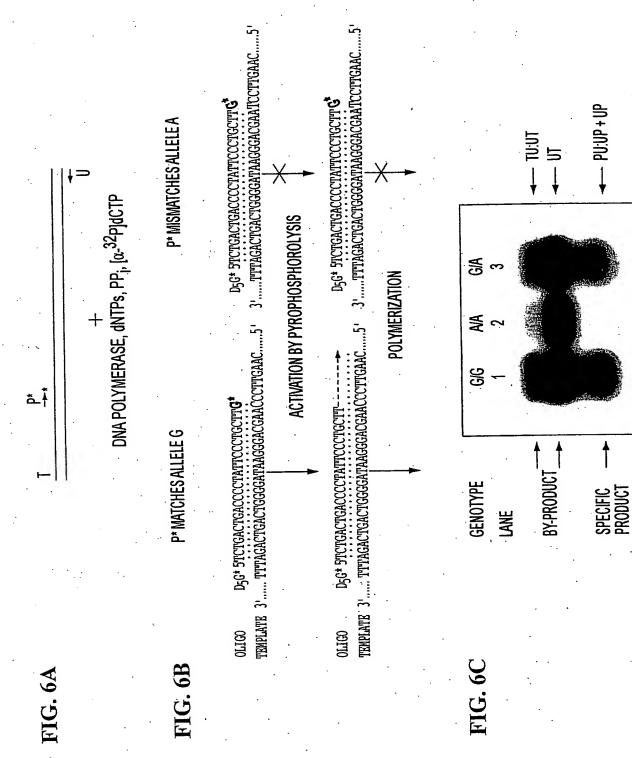
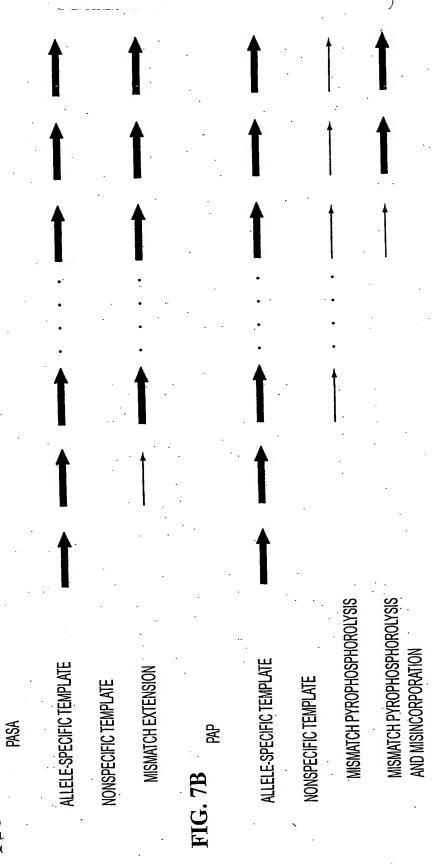


FIG. 5





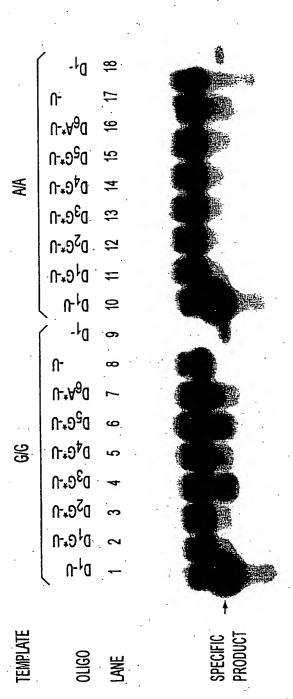


FIG. 8A

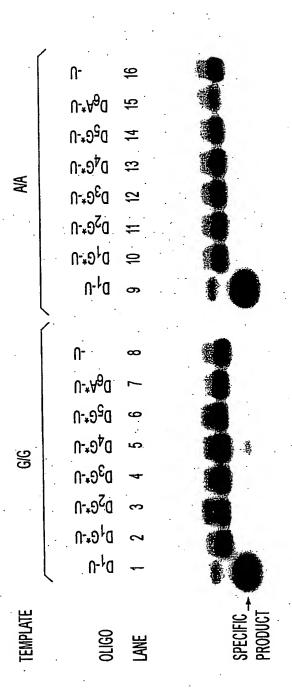
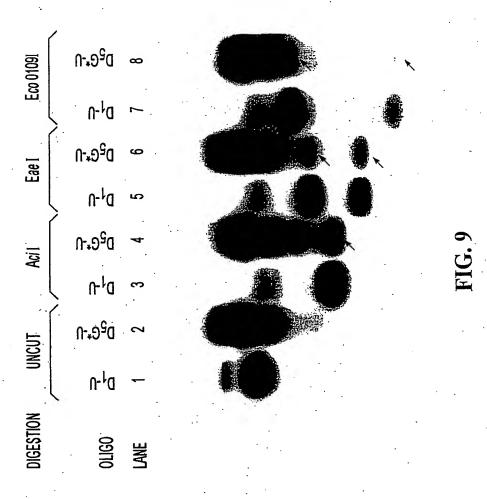
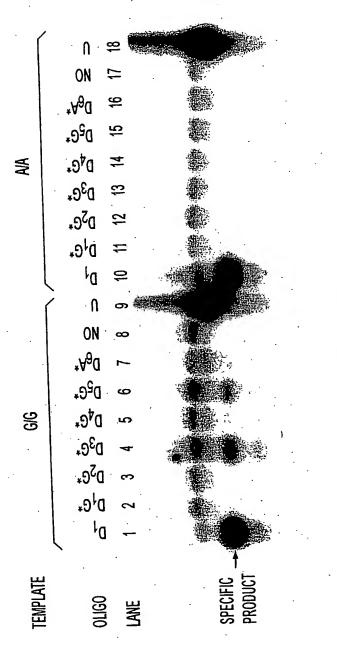
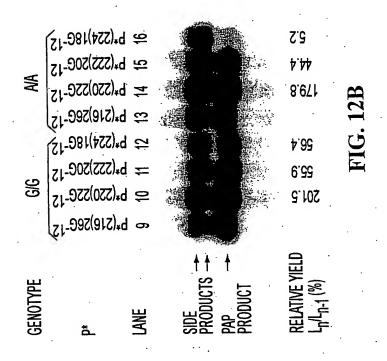


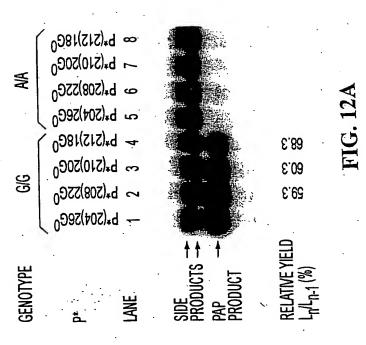
FIG. 8B











Pyrophosphorolysis Activated Polymerization (PAP) Qiang LIU et al., Cont. Appln. filed 12 March 2004 Atty. Docket No. 1954-439 - Page 14 of 33 Pages

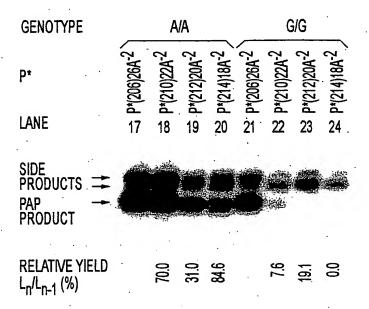
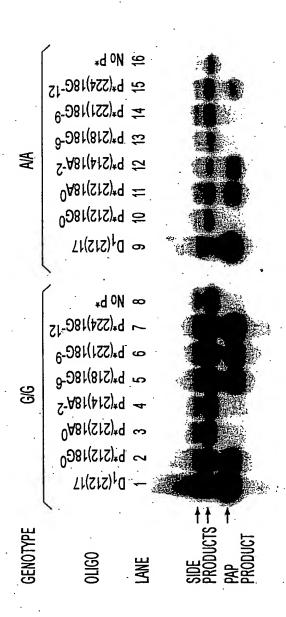


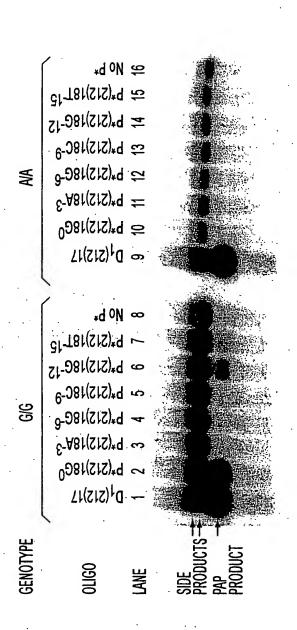
FIG. 12C

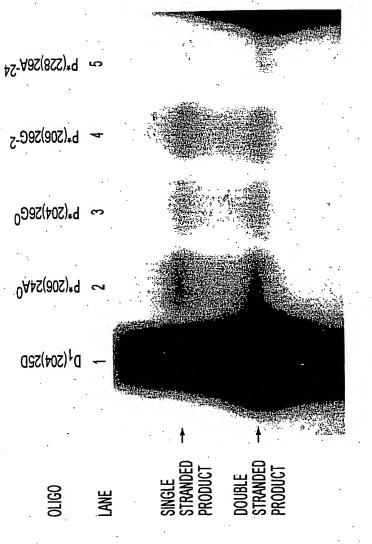
GENOTYPE ⁻	A/A.	GENOTYPE	A/A
p*	P*(206)26G-9 P*(210)22G-9 P*(212)20G-9 P*(214)18G-9	p *	P*(206)26T-15 P*(210)22T-15 P*(212)20T-15 P*(214)18T-15
LANE	25 26 27 28	LANE	29 30 31 32
SIDE PRODUCTS == PAP PRODUCT		SIDE PRODUCTS == PAP PRODUCT	
RELATIVE YIELI L _n /L _{n-1} (%)	94.8 9.0 9.0	RELATIVE YIELD L _n /L _{n-1} (%)	37.6 2.2 0.0

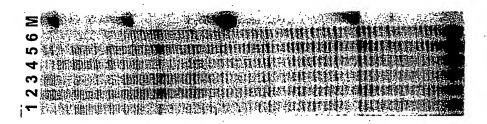
FIG. 12D

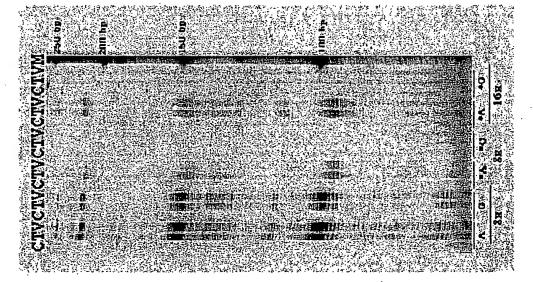
FIG. 12E













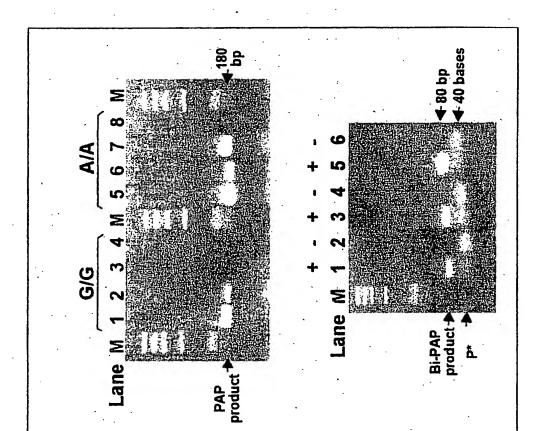


FIG. 18A

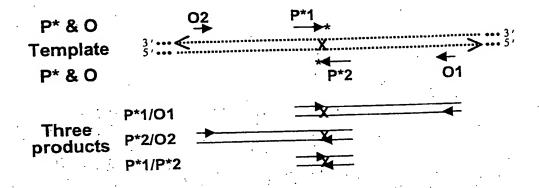


FIG. 18B

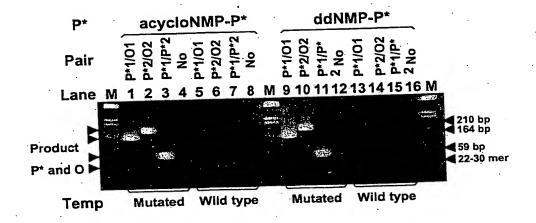


FIG. 18C

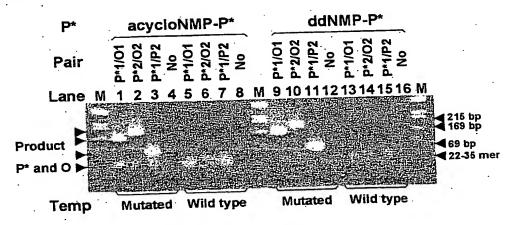


FIG. 18D

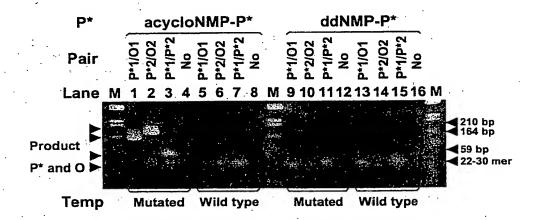
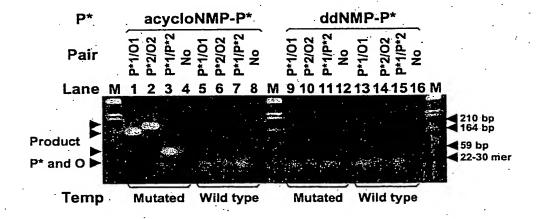


FIG. 18E



Specific amplification		Nonspecific amplification
	H	H
P* 5'.CACA \mathbf{T}^{\star} Template 3'.CGTGT \mathbf{A} GTTG.5	5'.CACA T * G.5' 3'.CGTGT T GTTG.5	5'.CACA T * FTG.5' 3'.CGTGT T GTTG.5'
Pyrophosphorolysis	Mismatch pyrophosphorolysis	Mismatch pyrophosphorolysis
P* 5'.CACA← Template 3'.CGTGTAGTTG.5	5'.CACA← G.5' 3'.CGTGT¶GTTG.5'	5′.CACA← ITG.5′ 3′.CGTGT T GTTG.5′
Polymerization	Polymerization	Misincorporation
Product 5'.CACA T_{CAA} > Template 3'.CGTGT ${f A}$ GTTG.5'	> 5'.CACA A CAA> G.5' 3'.CGTGT T GTTG.5'	AA> 5'.CACA $T_{CAA>}$ ITG.5' 3'.CGTGT \mathbf{T} GTTG.5'
P* Mutated Template Mutated Product Mutated Frequency 1	Mutated Wild type Wild type 10-5	Mutated Wild type Mutated 3.3x10-11

Product Template: P* Match Product No Mut:Mut Yes Yes	ACCGCC.5' 3'.CGCACCGTGTAGTTGACCGCC.5' IGGCGG.3' 5'.GCGTGGCACATCAACTGGCGG.3' AAGTTGACCG5'	Bi-PAP
Template: P* Match Product WT:Mut No No	<pre>P* 5'TGGCACAT* 3'.CGCACCGTGTTTGTTGACCGCC.5' T 5'.GCGTGGCACAACTGGCGG.3' P* *AGTTGACC5'</pre>	

TG. 20A

5'...TGGCACA*T*CAACTGG...> <...ACCGTGT**A**GTTGACC...5'

s'...TGGCACA**T*** *AGTTGACC...s'

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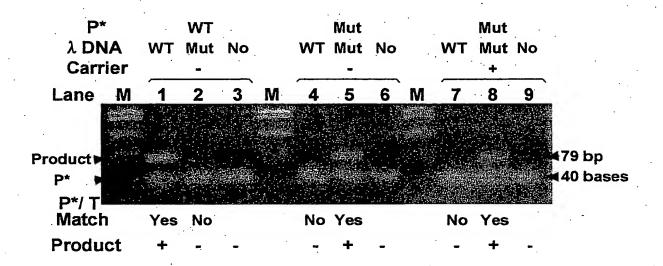


FIG. 20B

Pyrophosphorolysis Activated Polymerization (PAP) Qiang LIU et al.. Cont. Appln. filed 12 March 2004 Atty. Docket No. 1954-439 - Page 25 of 33 Pages

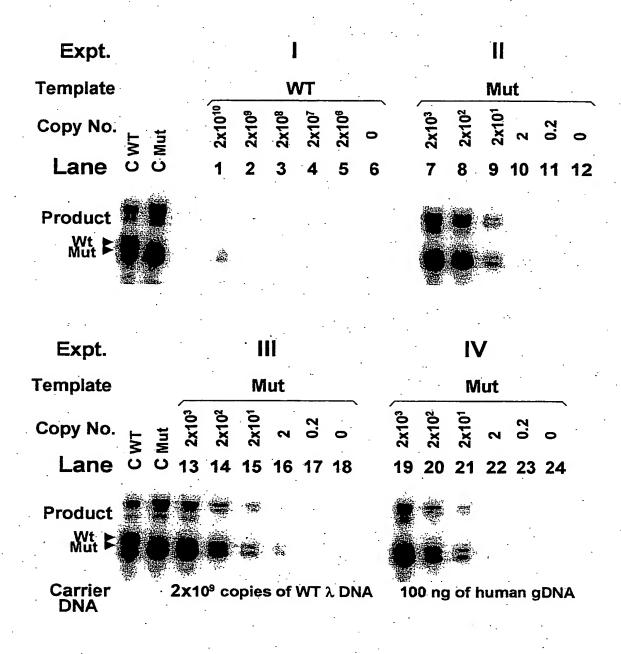


FIG. 21A

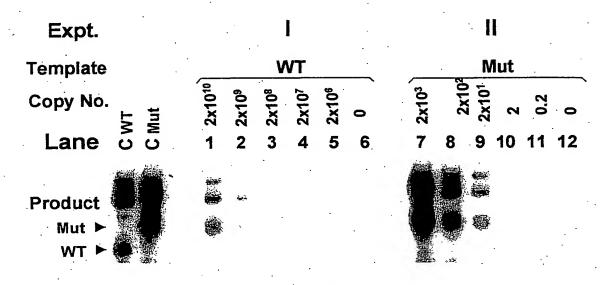


FIG. 21B

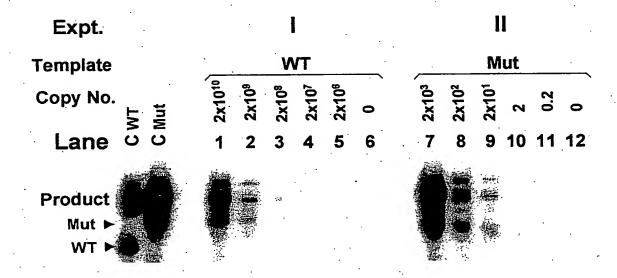


FIG. 21C

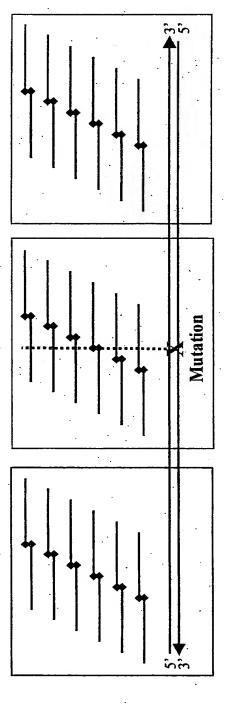


FIG. 22

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Wildty Templa	-	.GCGTGGCACAACTGGCGG.3' .CGCACCGTGTTGTTGACCGCC.5'	<u>Match</u>
	WT	5'TGGCACA ^{A*} *TGTTGACC5'	Yes
P*	Mut	5'TGGCACA T* * A GTTGACC5'	No
•	Mut	5'TGGCACA G* * C GTTGACC5'	No
	Mut	5'TGGCACA C* * G GTTGACC5'	No
		PAP	<u>Product</u>
	WT	5'TGGCACAACACTGG> <accgtgtTGTTGACC5'</accgtgt	userson an
	Mut	5'TGGCACA T* * A GTTGACC5'	-
P*	Mut	5'TGGCACA G* *CGTTGACC5'	-
	Mut	5'TGGCACA C* * G GTTGACC5'	-

FIG. 23A

Mutar Templa		.GCGTGGCACATCAACTGGCGG.3'.CGCACCGTGTAGTTGACCGCC.5'	<u>Match</u>
	WT	5'TGGCACAA* *TGTTGACC5'	No
P *	Mut	5'TGGCACA T* * A GTTGACC5'	Match
	Mut	5'TGGCACA G* * C GTTGACC5'	No
	Mut	5'TGGCACA C* * G GTTGACC5'	No
		PAP	<u>Product</u>
	WT	5'TGGCACAA* *TGTTGACC5'	· · -
D +	Mut	5'TGGCACA <i>T</i> CAACTGG> <accgtgtAGTTGACC5'</accgtgt	
P*	Mut	5'TGGCACA G* * C GTTGACC5'	-
	Mut	5'TGGCACA ^{C*} * G GTTGACC5'	-

FIG. 23B

5'-3' strand of the wild type sequence G C G T G C A C A A C A A

	7.00			
٠				
rray	man and			
CLO3				
gnais o				
7	<u> </u>	√	Ü	G
	P*ddA⊕/⟨=P*ddT	P*ddT≒/⟨⇒P*ddA	P*ddG=∜/⊕P*ddC	P*ddC÷//⊱P*ddG

5'→3' calling of the wild type sample

FIG. 24A

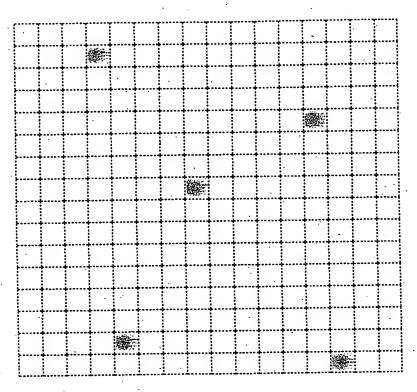
5'-3' strand of the wild type sequence

ignals on microarray					< mintation window >
	P*ddA⇒/⟨⇒P*ddT	P*ddT⇒/⟨⇒P*ddA	P*ddG-⇒/⟨-P*ddC	P*ddC⊕/⊱P*ddG	

5'-3' calling of the mutated sample

FIG. 24B

Pyrophosphorolysis Activated Polymerization (PAP) Qiang LIU et al., Cont. Appln. filed 12 March 2004 Atty. Docket No. 1954-439 - Page 32 of 33 Pages



Assembly of positive signals by one base overlapping

5'...TGGCACA**A***
***T**GTTGACC...5'

5'...GGCACAAC*
*GTTGACCG...5'

5'...GCACAACA*
*TTGACCGC...5'

5'...CACAACA**A*** ***T**GACCGCC...5'

Reconstruction of the unknown sequence

5' ACAA 3'
TGTT 5'



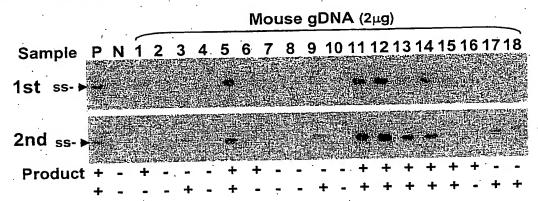


FIG. 26B

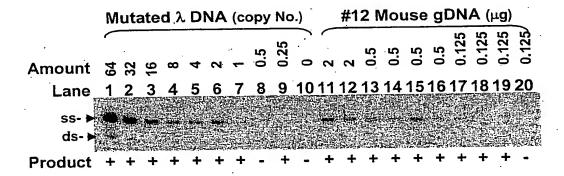


FIG. 26C